

SEQUENCE LISTING

<110> Turner, C. Alexander Jr.
Mathur, Daniel
Mathur, Brian

<120> Novel Human Ion Channel Proteins and Polynucleotides Encoding the Same

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 Ile Phe Gly Ser Phe Phe Thr Leu Asn Leu Phe Ile Gly Val Ile Ile
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Phe Ile Val Leu Phe Thr Gly Glu Cys Val Leu Lys Leu Ile Ser Leu		
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Arg His Tyr Tyr Phe Thr Ile Gly Trp Asn Ile Phe Asp Phe Val Val		
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Glu Val Ser Ala Val Ile Ile Gln Arg Ala Tyr Arg Arg His Leu Leu		
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Lys Arg Thr Val Lys Gln Ala Ser Phe Thr Tyr Asn Lys Asn Lys Ile		
1925	1930	1935
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Lys Ala Lys Asn Pro Lys Pro Asp Lys Lys Asp Asp Asp Glu Asn Gly
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Tyr Gly Asp Ile Pro Pro Glu Met Val Ser Glu Pro Leu Glu Asp Leu
          65          70          75          80
Asp Pro Tyr Tyr Ile Asn Lys Lys Thr Phe Ile Val Leu Asn Lys Gly
          85          90          95
Lys Ala Ile Phe Arg Phe Ser Ala Thr Ser Ala Leu Tyr Ile Leu Thr
          100          105          110
Pro Phe Asn Pro Leu Arg Lys Ile Ala Ile Lys Ile Leu Val His Ser
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Met Thr Met Ser Asn Pro Pro Asp Trp Thr Lys Asn Val Glu Tyr Thr
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Phe Thr Gly Ile Tyr Thr Phe Glu Ser Leu Ile Lys Ile Ile Ala Arg
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Gly Phe Cys Leu Glu Asp Phe Thr Phe Leu Arg Asp Pro Trp Asn Trp
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Lys Thr Ile Ser Val Ile Pro Gly Leu Lys Thr Ile Val Gly Ala Leu
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Cys Leu Ser Val Phe Ala Leu Ile Gly Leu Gln Leu Phe Met Gly Asn
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Leu Arg Asn Lys Cys Ile Gln Trp Pro Pro Thr Asn Ala Ser Leu Glu
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Glu	Gln	Leu	Lys	Lys	Gln	Gln	Glu	Ala	Ala	Gln	Gln	Ala	Ala	Thr	Ala
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Gln	Lys	Cys	Pro	Pro	Cys	Trp	Tyr	Lys	Phe	Ser	Asn	Ile	Phe	Leu	Ile
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Val	Val	Met	Asp	Pro	Phe	Val	Asp	Leu	Ala	Ile	Thr	Ile	Cys	Ile	Val
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Tyr	Gly	Asp	Ile	Pro	Pro	Glu	Met	Val	Ser	Glu	Pro	Leu	Glu	Asp	Leu
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Asp	Pro	Tyr	Tyr	Ile	Asn	Lys	Lys	Thr	Phe	Ile	Val	Leu	Asn	Lys	Gly
			85						90					95	
Lys	Ala	Ile	Phe	Arg	Phe	Ser	Ala	Thr	Ser	Ala	Leu	Tyr	Ile	Leu	Thr
			100					105					110		
Pro	Phe	Asn	Pro	Leu	Arg	Lys	Ile	Ala	Ile	Lys	Ile	Leu	Val	His	Ser
		115					120					125			
Leu	Phe	Ser	Met	Leu	Ile	Met	Cys	Thr	Ile	Leu	Thr	Asn	Cys	Val	Phe
	130					135					140				
Met	Thr	Met	Ser	Asn	Pro	Pro	Asp	Trp	Thr	Lys	Asn	Val	Glu	Tyr	Thr
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Phe	Thr	Gly	Ile	Tyr	Thr	Phe	Glu	Ser	Leu	Ile	Lys	Ile	Ile	Ala	Arg
			165						170					175	
Gly	Phe	Cys	Leu	Glu	Asp	Phe	Thr	Phe	Leu	Arg	Asp	Pro	Trp	Asn	Trp
			180					185					190		
Leu	Asp	Phe	Thr	Val	Ile	Thr	Phe	Ala	Tyr	Val	Thr	Glu	Phe	Val	Asp

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Leu Gly Asn Val Ser Ala	Leu Arg Thr Phe Arg Val	Leu Arg Ala Leu
210	215	220
Lys Thr Ile Ser Val Ile	Pro Gly Leu Lys Thr Ile	Val Gly Ala Leu
225	230	235
Ile Gln Ser Val Lys Lys	Leu Ser Asp Val Met Ile	Leu Thr Val Phe
245	250	255
Cys Leu Ser Val Phe Ala	Leu Ile Gly Leu Gln Leu	Phe Met Gly Asn
260	265	270
Leu Arg Asn Lys Cys Ile	Gln Trp Pro Pro Thr Asn	Ala Ser Leu Glu
275	280	285
Glu His Ser Ile Glu Lys	Asn Ile Thr Val Asn Tyr	Asn Gly Thr Leu
290	295	300
Ile Asn Glu Thr Val Phe	Glu Phe Asp Trp Lys Ser	Tyr Ile Gln Asp
305	310	315
Ser Arg Tyr His Tyr Phe	Leu Glu Gly Phe Leu Asp	Ala Leu Leu Cys
325	330	335
Gly Asn Ser Ser Asp Ala	Gly Gln Cys Pro Glu Gly	Tyr Met Cys Val
340	345	350
Lys Ala Gly Arg Asn Pro	Asn Tyr Gly Tyr Thr Ser	Phe Asp Thr Phe
355	360	365
Ser Trp Ala Phe Leu Ser	Leu Phe Arg Leu Met Thr	Gln Asp Phe Trp
370	375	380
Glu Asn Leu Tyr Gln Leu	Thr Leu Arg Ala Ala Gly	Lys Thr Tyr Met
385	390	395
Ile Phe Phe Val Leu Val	Ile Phe Leu Gly Ser Phe	Tyr Leu Ile Asn
405	410	415
Leu Ile Leu Ala Val Val	Ala Met Ala Tyr Glu Glu	Gln Asn Gln Ala
420	425	430
Thr Leu Glu Glu Ala Glu	Gln Lys Glu Ala Glu Phe	Gln Gln Met Ile
435	440	445
Glu Gln Leu Lys Lys Gln	Gln Glu Ala Ala Gln Gln	Ala Ala Thr Ala
450	455	460
Thr Ala Ser Glu His Ser	Arg Glu Pro Ser Ala Ala	Gly Arg Leu Ser
465	470	475
Asp Ser Ser Ser Glu Ala	Ser Lys Leu Ser Ser Lys	Ser Ala Lys Glu
485	490	495
Arg Arg Asn Arg Arg Lys	Lys Arg Lys Gln Lys Glu	Gln Ser Gly Gly
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Glu Glu Lys Asp Glu Asp	Glu Phe Gln Lys Ser Glu	Ser Glu Asp Ser
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Tyr Glu Lys Arg Tyr Ser	Ser Pro His Gln Ser Leu	Leu Ser Ile Arg
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Gly Ser Leu Phe Ser Pro	Arg Arg Asn Ser Arg Thr	Ser Leu Phe Ser
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Phe Arg Gly Arg Ala Lys	Asp Val Gly Ser Glu Asn	Asp Phe Ala Asp
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Asp Glu His Ser Thr Phe	Glu Asp Asn Glu Ser Arg	Arg Asp Ser Leu
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Phe Val Pro Arg Arg His	Gly Glu Arg Arg Asn Ser	Asn Leu Ser Gln
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Thr Ser Arg Ser Ser Arg	Met Leu Ala Val Phe Pro	Ala Asn Gly Lys
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Met His Ser Thr Val Asp	Cys Asn Gly Val Val Ser	Leu Val Gly Gly
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Pro Ser Val Pro Thr Ser	Pro Val Gly Gln Leu Leu	Pro Glu Val Ile
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Ile Asp Lys Pro Ala Thr	Asp Asp Asn Gly Thr Thr	Thr Glu Thr Glu
675	680	685
Met Arg Lys Arg Arg Ser	Ser Ser Phe His Val Ser	Met Asp Phe Leu
690	695	700

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Thr	Asn	Thr	Val	Glu	Glu	Leu	Glu	Glu	Ser	Arg	Gln	Lys	Cys	Pro	Pro
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Cys	Trp	Tyr	Lys	Phe	Ser	Asn	Ile	Phe	Leu	Ile	Trp	Asp	Cys	Ser	Pro
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Tyr	Trp	Leu	Lys	Val	Lys	His	Val	Val	Asn	Leu	Val	Val	Met	Asp	Pro
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Phe	Val	Asp	Leu	Ala	Ile	Thr	Ile	Cys	Ile	Val	Leu	Asn	Thr	Leu	Phe
	770					775					780				
Met	Ala	Met	Glu	His	Tyr	Pro	Met	Thr	Asp	His	Phe	Asn	Asn	Val	Leu
785					790					795					800
Thr	Val	Gly	Asn	Leu	Val	Phe	Thr	Gly	Ile	Phe	Thr	Ala	Glu	Met	Phe
			805						810					815	
Leu	Lys	Ile	Ile	Ala	Met	Asp	Pro	Tyr	Tyr	Tyr	Phe	Gln	Glu	Gly	Trp
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Asn	Ile	Phe	Asp	Gly	Phe	Ile	Val	Thr	Leu	Ser	Leu	Val	Glu	Leu	Gly
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Leu	Ala	Asn	Val	Glu	Gly	Leu	Ser	Val	Leu	Arg	Ser	Phe	Arg	Leu	Leu
	850					855					860				
Arg	Val	Phe	Lys	Leu	Ala	Lys	Ser	Trp	Pro	Thr	Leu	Asn	Met	Leu	Ile
865					870					875					880
Lys	Ile	Ile	Gly	Asn	Ser	Val	Gly	Ala	Leu	Gly	Asn	Leu	Thr	Leu	Val
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Gly	Lys	Ser	Tyr	Lys	Asp	Cys	Val	Cys	Lys	Ile	Ala	Ser	Asp	Cys	Gln
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Glu	Val	Ala	Gly	Gln	Ala	Met	Cys	Leu	Thr	Val	Phe	Met	Met	Val	Met
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Gly Ala Leu Ala Phe Glu Asp Ile Tyr Ile Asp Gln Arg Lys Thr Ile					
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Lys Thr Met Leu Glu Tyr Ala Asp Lys Val Phe Thr Tyr Ile Phe Ile					
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Leu Glu Met Leu Leu Lys Trp Val Ala Tyr Gly Tyr Gln Thr Tyr Phe					
1265		1270		1275	1280
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Val Ser Leu Thr Ala Asn Ala Leu Gly Tyr Ser Glu Leu Gly Ala Ile					
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Lys Ser Leu Arg Thr Leu Arg Ala Leu Arg Pro Leu Arg Ala Leu Ser					
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Arg Phe Glu Gly Met Arg Val Val Val Asn Ala Leu Leu Gly Ala Ile					
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Pro Ser Ile Met Asn Val Leu Leu Val Cys Leu Ile Phe Trp Leu Ile					
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Phe Ser Ile Met Gly Val Asn Leu Phe Ala Gly Lys Phe Tyr His Cys					
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Ile Asn Thr Thr Thr Gly Asp Arg Phe Asp Ile Glu Asp Val Asn Asn					
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His Thr Asp Cys Leu Lys Leu Ile Glu Arg Asn Glu Thr Ala Arg Trp					
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Phe Thr Leu Asn Leu Phe Ile Gly Val Ile Ile Asp Asn Phe Asn Gln					
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Gln Lys Lys Lys Phe Gly Gly Gln Asp Ile Phe Met Thr Glu Glu Gln					
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Lys Lys Tyr Tyr Asn Ala Met Lys Lys Leu Gly Ser Lys Lys Pro Gln					
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Val Gly Met Phe Leu Ala Glu Leu Ile Glu Lys Tyr Phe Val Ser Pro					
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Thr Leu Phe Arg Val Ile Arg Leu Ala Arg Ile Gly Arg Ile Leu Arg					
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Leu Ile Lys Gly Ala Lys Gly Ile Arg Thr Leu Leu Phe Ala Leu Met					
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Met Ser Leu Pro Ala Leu Phe Asn Ile Gly Leu Leu Leu Phe Leu Val					
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Arg Glu Val Gly Ile Asp Asp Met Phe Asn Phe Glu Thr Phe Gly Asn					
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Ser Met Ile Cys Leu Phe Gln Ile Thr Thr Ser Ala Gly Trp Asp Gly
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 1810 1815 1820
 Phe Glu Lys Leu Ser Gln Phe Ala Ala Ala Leu Glu Pro Pro Leu Asn
 1825 1830 1835 1840
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 Ser Arg Tyr His Tyr Phe Leu Glu Gly Phe Leu Asp Ala Leu Leu Cys
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 Lys Ala Gly Arg Asn Pro Asn Tyr Gly Tyr Thr Ser Phe Asp Thr Phe
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 Asp Ser Ser Ser Glu Ala Ser Lys Leu Ser Ser Lys Ser Ala Lys Glu
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 Glu Glu Lys Asp Glu Asp Glu Phe Gln Lys Ser Glu Ser Glu Asp Ser
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 Lys Ala Gly Arg Asn Pro Asn Tyr Gly Tyr Thr Ser Phe Asp Thr Phe
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 Glu Asn Leu Tyr Gln Leu Thr Leu Arg Ala Ala Gly Lys Thr Tyr Met
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Glu	Glu	Lys	Asp	Glu	Asp	Glu	Phe	Gln	Lys	Ser	Glu	Ser	Glu	Asp	Ser
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 His Asn Trp Phe Glu Thr Phe Ile Val Phe Met Ile Leu Leu Ser Ser
 1220 1225 1230
 Gly Ala Leu Ala Phe Glu Asp Ile Tyr Ile Asp Gln Arg Lys Thr Ile
 1235 1240 1245
 Lys Thr Met Leu Glu Tyr Ala Asp Lys Val Phe Thr Tyr Ile Phe Ile
 1250 1255 1260
 Leu Glu Met Leu Leu Lys Trp Val Ala Tyr Gly Tyr Gln Thr Tyr Phe
 1265 1270 1275 1280
 Thr Asn Ala Trp Cys Trp Leu Asp Phe Leu Ile Val Asp Val Ser Leu
 1285 1290 1295
 Val Ser Leu Thr Ala Asn Ala Leu Gly Tyr Ser Glu Leu Gly Ala Ile
 1300 1305 1310
 Lys Ser Leu Arg Thr Leu Arg Ala Leu Arg Pro Leu Arg Ala Leu Ser

1315	1320	1325
Arg Phe Glu Gly Met Arg Asp Asn Leu Ala Pro Thr Trp Met Gly Trp		
1330	1335	1340
Ser Ala Gly Ser Ser Pro Glu Pro Phe Ile Met Gly Gly Cys Glu Cys		
1345	1350	1355
Pro Phe Arg Ser Asn Ser Ile His His Glu Cys Ala Ser Gly Leu Ser		
	1365	1370
Tyr Ile Leu Ala Asn Phe Gln His His Gly Arg Lys Phe Val Cys Trp		
	1380	1385
Gln Ile Leu Pro Leu Tyr		1390
1395		